

A Controlled Technique for Vein Stripping

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FROM A COMBINATION, adaptation and modification of methods reported by other surgeons, the authors have developed a technique of intraluminal stripping of the saphenous vein in treatment of varicosities that is relatively easy to perform and that obviates a number of difficulties that were encountered in various cases.

Stripping alone is considered less than adequate treatment for varicosities of the lower extremities, but it is believed that, with the technique of controlled operation here described, it is possible to carry out at the same time other more radical procedures such as those advocated by Linton,⁴ Sherman⁷ and Wassell and Ettinger.⁶

When the authors first began to do vein stripping early in 1949, using the accepted technique of high ligation and then insertion of the stripper through the divided upper portion of the saphenous vein, often a good deal of time was spent in passing the stripper distally. Frequently it was impossible to force the stripper beyond the knee, necessitating an incision for removal at that point and reinsertion for further passage to the ankle. So much time was taken by these procedures that often when both legs had to be treated the operation was excessively long. On many occasions the stripper either would not pass some of the valves or would enter one of the relatively major branches and have to be freed and redirected along the main tributary. The main features of the technique that was worked out to surmount these difficulties are the routine practice of stripping from below upward (a procedure that has been described by De Takats and Fowler² and Kutz and Hendricks³) and control of pressure while applying traction to the stripper. It has been in use since mid-1950.

PREOPERATIVE MANAGEMENT

When examination and employment of the routine tests for competency of the saphenous vein and the communicating branches have been completed and an operation indicated, the patient is instructed to use one of the hexachlorophene soaps faithfully for a week before the operation, maintaining a cleansing lather for at least six minutes daily. In addition the patient is requested not to use elastic bandages within the last three days before operation,

• A number of difficulties encountered in vein stripping operations for varicose veins in the legs have been overcome by use of a technique evolved by adaptation and modifications of various reported methods.

The stripping instrument is passed from below upward, the valves or branches offering less impediment to its passage in that direction.

Inserting the tip of the instrument at the ankle through an incision in the vein while it is still in continuity is easier than introducing it into the end of a transected vein. Ligation of major superficial branches or subfascial division of communicating veins can be readily carried out while the stripper is still in place in the vein.

Applying pressure bandages to the entire length of the leg before removing the stripper and the telescoped vein diminishes the chances of ecchymosis yet does not hinder withdrawal of the instrument and the vein.

in order that the varicose veins may become fully distended and the marking of "blowouts" and of the major branches to be divided be made easier. The evening before operation, after the operative area has been thoroughly shaved, hexachlorophene soap is again freely used to cleanse the extremities and groin.

With the patient in a standing position, the skin over the general course of the vein and the branches and communicating vessels that are to be treated is marked with Berwick's dye or gentian violet solution. When the patient is in the surgery, before operation is begun the areas previously marked are scratched so that adequate markings will remain even should the dye be washed away during the preparation of the leg.

As is advocated by Adams,¹ a board is placed under the mattress across the foot of the operating table, the ends of the board extending about a foot on each side to facilitate changing the position of the extremity during operation. Pontocaine intraspinally or sodium pentothal intravenously, supplemented by nitrous oxide and oxygen, is used for anesthesia.

OPERATION

The authors use the oblique incision in the inguinal crease, developing it by sharp dissection until the saphenous vein is located. Then careful sharp dissection and some blunt dissection are performed within the sheath of the vein until all the branches near the saphenofemoral junction are isolated, divided and ligated with triple-0 silk. Frequently, to obtain better visualization of posteriorly placed branches, the vein is divided between clamps about 5 cm. distal to the saphenofemoral junction.

When all of the branches have been divided and the saphenous vein has been freed to its union with the femoral vein, a ligature of double-0 silk is placed at the juncture and a transfixion suture of the same material is placed distal to the ligature. If the vein has not been divided previously, division is carried out at this time. The wound is then flushed with warm saline solution and covered with a towel and attention is shifted to the ankle.

The flexible Meyers instrument is used for stripping. Passing it from the ankle upward has been found easier than from the groin downward, and in most cases it has been readily threaded through the entire length of the vein. The angle of the branches and the valves seems to be such that retrograde passage is easier. After the stripper is threaded through, it is left in place while pressure bandages are applied. Then the stripper and the vein are withdrawn through the previously made inguinal incisions. This sequence of procedure obviates the necessity of maintaining hand pressure over the sides of the stripped veins and diminishes the possibility that bleeding will occur, as it might if the hands had to be moved for placement of pressure dressings.

Unless the conditions are such that a more distal stripping is necessary, an incision is made just anterior and superior to the medial malleolus, and the distal portion of the saphenous vein is located and freed from the surrounding structures. Two ligatures of double-0 silk are placed around the vein and the distal one is securely tied. The first knot is made in the proximal ligature but is not cinched down on the vein until the stripper has been passed. In the segment of vein between the two ligatures, a transverse incision is made and one or two mosquito clamps are placed on the cut margins to permit easy opening of the incision for insertion of the stripper. It has been found to be much simpler to insert the stripper in a vein that has been incised in continuity (Figure 1, B) than through the cut end of a vein that has been transected. The tip of the stripper—the "olive"—is inserted and passed upward for a distance of 3 to 5 cm. and the proximal ligature is snugged to retard bleeding from the open stoma but

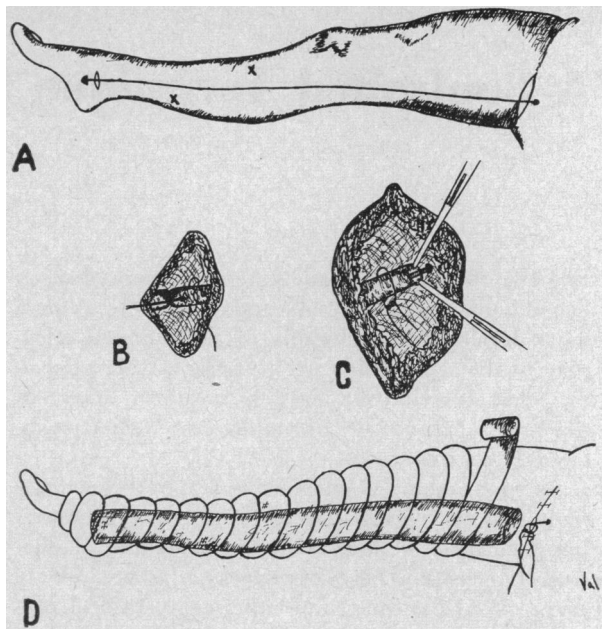


Figure 1.—A, stripper in vein before it is tied in place at the ankle. Marks on the leg indicate additional branches to be ligated. B, stripper passed through transverse incision in vein near medial malleolus. Vein tied off distally, loosely tied proximally over stripper. C, small "olive" tip of stripper emerging through distal cut end of saphenous vein in the thigh. Small hemostats grasp vein edges. Ligature is loosely tied until stripper has been withdrawn to the desired distance. D, all wounds have been closed except for one suture which has not been tied at site of emergence of stripper. A rolled bath towel and biased stockinette pressure dressings have been applied and stripper is ready for removal with avulsion of its enclosing telescoped vein.

is still not tightened completely lest passage of the stripper be impeded. The instrument is threaded upward toward the groin. Usually this can be done with relatively little manipulation of the leg and external pressure over the vein.

When the tip of the instrument is felt in the upper saphenous vein at the site of previous division, a ligature of double-0 silk is placed around the vein. The clamp at the cut margin is not removed. Only the first knot is made in the ligature and it is not cinched too tight. Two small mosquito forceps are placed at the edges of the cut portion of the saphenous vein to anchor the free end above the Mayo clamp (Figure 1, C). The clamp is then removed and as the stripper is forced out of the vein, the knot of the ligature is drawn tight. The stripper is withdrawn until the bulb at the distal end reaches the point where the vein had been incised at the ankle. The distal ligature is then tied tight and reinforced with an additional ligature. Division of the ankle vein then is carried out.

The tip of the stripper that has been drawn up through the saphenous vein at the groin is pulled until the distal bulb and telescoping vein have been

drawn upward for a distance of 2 to 3 cm. from the edge of the incision. The ligature around the superior portion of the saphenous vein is then tied tight and reinforced. The incision at the ankle is closed with interrupted No. 36 steel wire sutures.

If further operation is required, the authors do it while the stripper is still in place. In many cases the larger tributaries are ligated and in some cases it is necessary to carry out subfascial division of the communicating branches. If it is necessary to make an incision the full length of the lower leg for adequate exposure of the communicating veins, this can be done with the stripper still in place in the saphenous vein.

After it has been irrigated with warm saline solution, the wound in the groin is closed, with triple-0 silk used for the thin fascial layers and No. 36 stainless steel wire for the skin. One suture in the skin at the point where the stripper is emerging from the wound is left untied until later.

Before the stripper and the vein which encloses it are removed, the leg is elevated for a short time to permit as much blood as possible to pass from the superficial to the deep veins. Then, with the leg still elevated, pressure bandages are applied. Placing a rolled bath towel longitudinally over the course of the saphenous vein and applying biased stockinette bandage over it (Figure 1, D) maintains adequate pressure. After bandage has been wrapped from the foot to the groin, the leg is put in a horizontal position and the stripper is pulled out with the vein telescoped upon it. (Rarely in the author's experience has inversion of the vein occurred during its removal.) This done, an assistant holds pressure at the groin while the suture that was left untied is knotted to complete the closure. Then another roll of biased stockinette is added for additional pressure from the toes to the groin. With this system, ecchymosis is minimal.

POSTOPERATIVE CARE

Ambulation is encouraged on the operative day and the heavy pressure bandages are kept in place

for three days. After they are removed, similar pressure is maintained for another three or four days, without so much bulk, by placing perineal pads over the course of the vein and applying either stockinette or elastic bandages to hold them in place. Then the patient wears elastic bandages from the knee to the toes for a two-week period. Sutures are removed seven to ten days after operation in most cases, but occasionally the wires are left in place for 12 to 14 days if healing is not satisfactory.

DISCUSSION

Although not enough time has elapsed for follow-up studies adequate for definite evaluation, results obtained with the technique described have been quite satisfactory thus far. Since they have been using it, the authors have less often resorted to longitudinal incision and subfascial ligation of the communicating vessels, preferring to wait and do local operation for ligation of communicating vessels that perforate, which seldom has happened.

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